

# AZ CC Review Key Q2T1

$$1) \frac{2x}{x-8} - \frac{5}{2} = \frac{x+8}{x-8} \quad \text{LCD}$$

$$\frac{4x}{2(x-8)} - \frac{5(x-8)}{2(x-8)} = \frac{2(x+8)}{2(x-8)} \Rightarrow 4x - 5x + 40 = 2x + 16$$

$$\begin{array}{r} -x + 40 = 2x + 16 \\ +x \quad -16 \quad +x \quad -16 \\ \hline 24 = 3x \end{array}$$

$x = \text{No Solution}$

$$24 = 3x$$

$$8 = x$$

reject

$$2) 3b^{-1/2} + 1 = 10$$

$$\begin{array}{r} -1 \quad -1 \\ \hline \end{array}$$

$$\frac{3b^{-1/2}}{3} = \frac{9}{3}$$

$$b^{-1/2} = 3$$

$$b = 3^{-2}$$

$$b = \frac{1}{3^2}$$

$$\boxed{b = \frac{1}{9}}$$

$$3) x - \sqrt{x+4} = 2$$

$$\begin{array}{r} -x \\ \hline \end{array}$$

$$\frac{-\sqrt{x+4}}{-1} = \frac{2-x}{-1}$$

$$(\sqrt{x+4})^2 = (x-2)^2$$

$$\begin{array}{r} x+4 = x^2 - 4x + 4 \\ -x-4 \quad \quad -x-4 \\ \hline \end{array}$$

$$0 = x^2 - 5x$$

$$0 = x(x-5)$$

$$\begin{array}{l} x=0 \\ \text{reject} \end{array} \quad \boxed{x=5}$$

$$4) 10x^2 + 38x + 24$$

$$2(5x^2 + 19x + 12)$$

$$5x^2 + 15x + 4x + 12$$

$$5x(x+3) + 4(x+3)$$

$$\boxed{2(x+3)(5x+4)}$$

$$ac=60$$

$$b=19$$

$$5) x^4 - 16$$

$$\begin{array}{c} (x^2+4)(x^2-4) \\ \boxed{(x^2+4)(x+2)(x-2)} \end{array}$$

$$6) x^2 - 8x + 4 = 0$$

$$a=1 \quad b=-8 \quad c=4 \quad x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(4)}}{2(1)} = \frac{8 \pm \sqrt{48}}{2} = \frac{8 \pm 4\sqrt{3}}{2} = \boxed{4 \pm 2\sqrt{3}}$$

$$7) x^4 - x^2 - 12 = 0$$

$$(x^2 - 4)(x^2 + 3) = 0$$

$$(x-2)(x+2)(x^2+3) = 0$$

$$x=2 \quad x=-2 \quad x^2+3=0$$

$$x^2 = -3$$

$$x = \pm \sqrt{-3}$$

$$\boxed{x = 2, -2, \pm i\sqrt{3}}$$

$$8) 16x^2 - 25 = 0$$

$$(4x+5)(4x-5) = 0$$

$$4x+5=0 \quad 4x-5=0$$

$$4x = -5 \quad 4x = 5$$

$$x = -\frac{5}{4} \quad x = \frac{5}{4}$$

$$\boxed{x = -\frac{5}{4}, \frac{5}{4}}$$

$$9) x^2 - x - 12 = 0$$

$$x^2 - x + \boxed{\frac{1}{4}} = 12 + \boxed{\frac{1}{4}}$$

$$\left(x - \frac{1}{2}\right)^2 = \frac{49}{4}$$

$$x - \frac{1}{2} = \pm \sqrt{\frac{49}{4}}$$

$$x = \frac{1}{2} \pm \sqrt{\frac{49}{4}}$$

$$x = \frac{1}{2} \pm \frac{7}{2}$$

$$x = \frac{1}{2} + \frac{7}{2}$$

$$x = \frac{1}{2} - \frac{7}{2}$$

$$\boxed{x = \frac{9}{4}}$$

$$\boxed{x = -\frac{5}{4}}$$

Half Square  
Shore  $\left(-\frac{1}{2}\right)^2 = \frac{1}{4}$

$$10) 3x^2 - 5 = 2x$$

$$3x^2 - 2x = 5$$

$$x^2 - \frac{2}{3}x + \boxed{\frac{1}{9}} = \frac{5}{3} + \boxed{\frac{1}{9}}$$

$$\left(x - \frac{1}{3}\right)^2 = \frac{16}{9}$$

$$x - \frac{1}{3} = \pm \sqrt{\frac{16}{9}}$$

$$x - \frac{1}{3} = \pm \frac{4}{3}$$

$$x = \frac{1}{3} \pm \frac{4}{3}$$

$$x = \frac{1}{3} + \frac{4}{3}$$

$$x = \frac{1}{3} - \frac{4}{3}$$

$$\boxed{x = \frac{5}{3}}$$

$$x = -\frac{3}{3} = \boxed{-1}$$

Half Square  
Shore  $\left(-\frac{2}{3}\right)^2 = \frac{4}{9}$

$$11) x^2 + 8x + 10 = 0$$

$$x^2 + 8x + \boxed{16} = -10 + \boxed{16}$$

$$(x+4)^2 = 6$$

$$x+4 = \pm \sqrt{6}$$

$$\boxed{x = -4 \pm \sqrt{6}}$$

half Square  
Shore  $\frac{8}{2} = 4$   
 $4^2 = 16$



$$12) x^2 = 6x - 1$$

$$x^2 - 6x + 1 = 0$$

$$a = 1$$

$$b = -6$$

$$c = 1$$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(1)}}{2(1)} = \frac{6 \pm \sqrt{32}}{2} = \frac{6 \pm 4\sqrt{2}}{2} = \boxed{3 \pm 2\sqrt{2}}$$

$$13) 2x^2 - 7 = 3x$$

$$2x^2 - 3x - 7 = 0$$

$$a = 2$$

$$b = -3$$

$$c = -7$$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(2)(-7)}}{2(2)} = \frac{3 \pm \sqrt{65}}{4}$$

$$\frac{3 + \sqrt{65}}{4} = \boxed{2.77}$$

$$\frac{3 - \sqrt{65}}{4} = \boxed{-1.27}$$

14) Discriminant = -2 ← negative therefore roots are Imaginary  $\boxed{2}$

15) Roots are equal than  $b^2 - 4ac = 0$

$$a = a$$

$$b = 4$$

$$c = 2$$

$$4^2 - 4(a)(2) = 0$$

$$16 - 8a = 0$$

$$16 = 8a$$

$$\boxed{2 = a}$$

16) Roots real than  $b^2 - 4ac \geq 0$

$$a = k$$

$$b = -5$$

$$c = 3$$

$$(-5)^2 - 4(k)(3) \geq 0$$

$$25 - 12k \geq 0$$

$$25 \geq 12k$$

$$\frac{25}{12} \geq k$$

$$2.08 \geq k$$

$$\boxed{K \text{ can be } = 2}$$

17) Roots are imaginary then  $b^2 - 4ac < 0$

$$a = 1$$

$$b = -6$$

$$c = c$$

$$(-6)^2 - 4(1)(c) < 0$$

$$16 - 4c < 0$$

$$16 < 4c$$

$$4 < c$$

$$\boxed{C \text{ can be } 5}$$

$$18) \frac{\frac{2x}{x+1}}{1 - \frac{x}{x+1}} \xrightarrow{\text{LCD } x+1} \frac{\frac{2x}{x+1}}{\frac{x+1}{x+1} - \frac{x}{x+1}} \Rightarrow \frac{2x}{x+1} \cdot \frac{x+1}{1} = \frac{2x}{1} = \boxed{2x}$$

$$19) \frac{x - \frac{1}{3}}{3 - \frac{1}{x}} \xrightarrow{\text{LCD } 3x} \frac{\frac{3x}{3} - \frac{1}{3}}{\frac{3x}{x} - \frac{1}{x}} \Rightarrow \frac{\frac{3x-1}{3}}{\frac{3x-1}{x}} \Rightarrow \frac{3x-1}{3} \cdot \frac{x}{3x-1} = \boxed{\frac{x}{3}}$$

$$20) \frac{4}{y^2-4} + \frac{3}{2y-y^2}$$

$$\frac{4}{(y+2)(y-2)} + \frac{3}{y(2-y)}$$

$$\frac{4}{(y+2)(y-2)} + \frac{-3}{y(y-2)}$$

$$\text{LCD} = y(y-2)(y+2)$$

$$\frac{4(y)}{y(y+2)(y-2)} + \frac{-3(y+2)}{y(y+2)(y-2)}$$

$$\frac{4y - 3y - 6}{y(y+2)(y-2)}$$

$$\boxed{\frac{y-6}{y(y+2)(y-2)}}$$